

### Claims

1. A magnetic recording medium, comprising a first Co-containing layer and a second Co-containing layer separated by a non-magnetic interlayer and a magnetic interlayer, wherein the magnetic interlayer has a higher magnetic density than that of the first and second Co-containing layers and the magnetic recording medium has Jex of  $0.1 \text{ erg/cm}^2$  or more.
2. The magnetic recording medium of claim 1, further comprising a third Co-containing layer.
3. The magnetic recording medium of claim 1, wherein the first and second Co-containing layers further comprise Cr, Pt and B.
4. The magnetic recording medium of claim 1, wherein the non-magnetic interlayer comprises a Ru-containing layer.
5. The magnetic recording medium of claim 1, wherein the magnetic interlayer comprises Co.
6. The magnetic recording medium of claim 1, wherein the magnetic recording medium has Jex of  $0.11 \text{ erg/cm}^2$  or more.

7. The magnetic recording medium of claim 1, wherein the magnetic recording medium is a longitudinal magnetic recording medium.

8. The magnetic recording medium of claim 1, wherein the non-magnetic interlayer is a Ru layer and the magnetic interlayer is a Co layer.

9. The magnetic recording medium of claim 8, wherein the magnetic interlayer has a thickness in a range from about 1 Å to about 20 Å.

10. The magnetic recording medium of claim 1, wherein the magnetic recording medium comprises

Cr/Cr<sub>90</sub>W<sub>10</sub>/Co<sub>77</sub>Cr<sub>8</sub>Pt<sub>7</sub>B<sub>8</sub>/Co<sub>64</sub>Cr<sub>12</sub>Pt<sub>6</sub>B<sub>8</sub>/Co/Ru/Co<sub>61</sub>Cr<sub>15</sub>Pt<sub>12</sub>B<sub>12</sub>/C.

11. A method of manufacturing a magnetic recording medium comprising:  
depositing a first Co-containing layer on a substrate already coated with seedlayer and/or underlayer to promote appropriate crystallographic orientation and grain structure,

depositing a Co layer on the first Co-containing layer,

depositing a Ru layer on the Co layer and

depositing a second Co-containing layer on the Ru layer,

wherein the Co layer and/or the Ru layer are deposited in a gas environment comprising a moiety selected from the group consisting of Xe, Kr and combinations thereof.

12. The method of manufacturing a magnetic recording medium of claim 11, wherein the gas environment has a gas pressure of less than 6 mTorr.

13. The method of manufacturing a magnetic recording medium of claim 11, wherein the gas environment has a gas pressure of less than 5 mTorr.

14. The method of manufacturing a magnetic recording medium of claim 11, wherein the magnetic recording medium has Jex of  $0.1 \text{ erg/cm}^2$  or more.

15. The method of manufacturing a magnetic recording medium of claim 11, wherein the magnetic recording medium has Jex of  $0.11 \text{ erg/cm}^2$  or more.

16. The method of manufacturing a magnetic recording medium of claim 11, further comprising depositing a third Co-containing layer between the underlayer and the first Co-containing layer..

17. The method of manufacturing a magnetic recording medium of claim 11, wherein the Ru layer has a thickness in a range of about 0.1 to 2 nm.

18. The method of manufacturing a magnetic recording medium of claim 11, wherein the thickness of the Co layer is in a range of about 0.1 to 2 nm.

19. The method of manufacturing a magnetic recording medium of claim 11, wherein the magnetic recording medium comprises  
 $\text{Cr/Cr}_{90}\text{W}_{10}/\text{Co}_{77}\text{Cr}_8\text{Pt}_7\text{B}_8/\text{Co}_{64}\text{Cr}_{12}\text{Pt}_6\text{B}_8/\text{Co/Ru/Co}_{61}\text{Cr}_{15}\text{Pt}_{12}\text{B}_{12}/\text{C}$ .

20. A magnetic recording medium, comprising a pair of Co-containing magnetic layers separated by means for improving the anti-ferromagnetic coupling of said pair of Co-containing magnetic layers.